AF/BPAI #16 Butler

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Christopher J. Lord; Karl O. Lillevold; Gim Deisher	Group Art Unit:	2614
Serial No.:	09/448,679	Examiner:	Trang U. Tran
Filed:	November 24, 1999	Atty. Dkt. No.:	ITL.0252US (P7381)
For:	NOISY EDGE REMOVAL FOR VIDEO TRANSMISSION		

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF TRANSMITTAL

Dear Sir:

Transmitted herewith in triplicate is the Appeal Brief in this application. The Notice of Appeal was filed on January 30, 2004.

Pursuant to M.P.E.P. § 1208.02, there is no fee due for this Appeal, because the Examiner reopened prosecution after filing of the first Appeal Brief on March 20, 2003. The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account No. 20-1504.

Respectfully submitted,

Date: March 30, 2004

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Date of Deposit: March 30, 2004
I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as **first class mail** with sufficient postage on the date indicated above and is addressed to the Board of Patent Appeal & Interferences, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Jennifer Juarez

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Board of Patent Appeals & Interferences
Commissioner for Patents
Washington, D.C. 20231

APPEAL BRIEF

Sir:

Applicants respectfully appeal from the final rejection mailed November 5, 2003.

I. REAL PARTY IN INTEREST

The real party in interest is the assignee Intel Corporation.

II. RELATED APPEALS AND INTERFERENCES

An Appeal Brief related to the above-entitled application was filed on March 20, 2003, and prosecution was reopened on July 17, 2003.

III. STATUS OF THE CLAIMS

Claims 1-33 are pending in the application. Claims 1-33 are rejected. Each rejection is appealed.

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Jennifer Juarez

IV. STATUS OF AMENDMENTS

No amendments are presently pending in the application. Claims 1-33 are the subject of this appeal.

V. SUMMARY OF THE INVENTION

In accordance with one embodiment of the invention, noisy edges in video frames may be removed to achieve higher frame rates and better quality video. The noisy edge removal mechanism may be used with applications which employ digital video encoding of captured content. Examples include video conferencing, video phone, network streaming video, and others. By detecting the presence of noisy edges in a video frame, a noisy line may be removed and replaced by a clean neighboring line prior to encoding. Noise may be removed from the top edge, either side edge, or the bottom edge of the video frame 10 as needed.

Turning to Figure 1, a noisy edge removal mechanism 20 may filter noise from a video frame 10 prior to entering a video encoder 18. In one embodiment of the invention, the noisy edge removal mechanism 20 includes a noisy edge detector 14 and a noisy edge filter 16. Initially, the noisy edge detector 14 receives a frame 10. The frame 10 is one of a plurality of frames 10 which make up a stream of video. The noisy edge removal mechanism 20 may be invoked for each frame 10 of the video stream, one at a time. For each frame 10, the noisy edge detector 14 analyzes one or more edges of the video frame 10. In one embodiment of the invention, an edge of the video frame 10 is selected, then divided into four equally sized portions. In Figure 2a, the top edge of the video frame 10 is divided into portions 20a, 21a, 22a, and 23a. These portions may be rows of the video frame 10, for example. See Specification, pages 2-3.

In Figure 2b, the left edge of the video frame 10 is divided into portions 20b, 21b, 22b, and 23b. These portions may be columns of the video frame 10, for example. In Figure 2c, the bottom edge of the video frame 10 is divided into portions 20c, 21c, 22c, and 23c. In Figure 2d, the right edge of the video frame is divided into portions 20d, 21d, 22d, and 23d. Once the edge of the video frame 10 is divided into portions of equal size, the portions are then subdivided into units of equal size. In Figure 3, a part of the video frame 10 of Figure 2a is subdivided into a plurality of units 24.

Each unit 24 of the video frame 10 is associated with a value. For example, a video display may be subdivided into pixels. Each pixel commonly has a value associated with the pixel, which may be stored in video memory. Each unit 24 of Figure 3 may likewise be associated with a distinct value.

In one embodiment of the invention, the noisy edge detector 14 determines the presence of noise based, in part, on comparisons between the values of the units 24 of the video frame 10. If adjacent units 24 are not similar, for example, noise may sometimes be inferred. So, once the video frame 10 is divided into discrete units 24, each one of which is assigned a value, mathematical operations may be performed to analyze the video frame 10.

Comparisons between values of the units 24 may be made using mathematical operations. In one embodiment, the values of the units 24 in one portion are compared to the values of the units 24 in a second, adjacent portion. The results of these comparisons are added together, to arrive at a result which is representative of the relationship between the two portions. A second pair of portions is likewise analyzed, supplying a second result, and so on. These results are then compared, and analyzed against one or more threshold values. In one embodiment of the

invention, the threshold values may be adaptable to the type of noise or other criteria. See Specification, p. 4-5.

In Figure 4, an analysis of the video frame 10, according to one embodiment of the invention, commences with the selection of an edge of the video frame (top, right, left, or bottom), subdivision of the video frame 10 into portions of equal size, and further subdivision in to units 24 (block 70). Once the edge of the video frame 10 has been subdivided into units 24, a pair of threshold values, T1 and T2, may be calculated (block 72). The threshold values are used to determine whether a value associated with one portion 20, 21, 22 or 23 of the video frame 10 varies significantly from a value associated with a second portion 20, 21, 22, or 23 of the video frame 10.

In one embodiment of the invention, these threshold values are based upon two variables, α and β. The values for α and β may be determined by analyzing one or more video frames 10 in which noise is known to be present. The values for α and β may also be based upon the source of the noise. For example, noise which results from the improper handling of closed captioning signals may produce a certain, predictable type of noise, to which a particular α value may be assigned. Alternatively, certain types of video capture devices may produce noise along the edges of the video frame, and thus a particular α or β variable may be appropriate. The α variable is presumed larger than the β variable, so that both a "stronger" (or larger) threshold value and a "weaker" (or smaller) threshold value may be used to analyze the edge of the video frame 10.

In one embodiment of the invention, once the α and β variables are known, T1 and T2 may be calculated based upon the following formulas:

$$T_1 = (\#\ \text{units/portion}) \times \alpha$$

$$T_2 = (\#\ \text{units/portion}) \times \beta$$

where $\alpha > \beta$. Because $\alpha > \beta$, the threshold value T1 is greater than the threshold value T2. See Specification, p. 5-6.

Looking back at Figure 4, a comparison of units 24 along an edge of the video frame 10 is performed (block 74). The comparison may be performed in a number of ways. In one embodiment of the invention, all units 24 of one portion are subtracted from all units 24 of an adjacent portion, to arrive at a plurality of results, the absolute values of which are then added together. This is called the sum of absolute differences, or SAD. In one embodiment, SAD values provide a discrete measure for analysis of the portions 20 through 23 of the video frame 10, not just the units 24 contained therein.

Turning back to Figure 4, once the SAD values for the portions 20 through 23 are determined, these values may be analyzed as well (block 76). In one embodiment of the invention, the "adjacent" SAD values are subtracted from one another, to arrive at one or more difference values, Dn. In one embodiment of the invention, once the difference values, D_1 and D_2, are calculated, they may then be analyzed against the threshold values, T_1 and T_2.

In accordance with one embodiment of the present invention, the analysis includes four comparisons between the values, D_1, D_2, T_1, and T_2, as shown in Figure 5. In one comparison, if D_2 is greater than T_1, because T_1 is the larger threshold value, noise is presumed to be found (diamond 82). Accordingly, two outermost portions, portion 20 and portion 21 of the video frame 10 are replaced with a third portion, portion 22, which is closer in from the edge of the video frame 10 (block 90).

Next, D_2 is compared to T_2 (diamond 84). If D_2 is larger than T_2, then D_2 is in between the two threshold values, T_1 and T_2. If, D_2 is between the two threshold values, and noise was found in the previous frame (as denoted by NOISEFOUND being TRUE), noise is presumed to

be found (diamond 84). The two outermost portions, portion 20 and portion 21, of the video frame 10 are replaced with a third portion, portion 22, which is closer in from the edge of the video frame 10 (block 90). See Specification, pp. 6-8.

In certain embodiments, calculations may identify noise by observing the spatial correlation between the portions 20 through 23 along the edge of the video frame 10. In other words, how similar portions 20 through 23 are to one another help to identify noise in the video frame 10. In addition to the calculations, noise detection in the previous frame may be included in analyzing the current frame. Once the noisy edge detector 14 has completed the analysis, the noisy edge filter 16 may replace one or more portions of the video frame 10 with a clean neighboring portion, in one embodiment of the invention. A new video frame 11 may then enter the video encoder 18.

A software program, for implementing one embodiment of the invention, shown in Figure 6, begins by clearing the Boolean variable, NOISEFOUND (block 102). NOISEFOUND indicates whether the previous frame required noise removal. An integer variable, FRAME, is also cleared to zero. FRAME keeps track of the current frame. FRAME is incremented (block 104). See Specification, p. 10.

For the current video frame received, the sum of absolute differences for the first four portions 20 through 23 of the video frame 10 is calculated (block 106). These calculations result in three values, SAD_{2021}, SAD_{2122}, and SAD_{2223}. Although four portions of the video frame 10 are analyzed in the example, this number may be adjusted to a larger or smaller number, as desired.

From the SAD values, two difference values, D_1, and D_2, are calculated. D_1 is the absolute value of the difference between SAD_{2021} and SAD_{2122}. Likewise, the second difference

value, D_2, represents the difference between SAD_{2122} and SAD_{2223}. The threshold values, T_1 and T_2, are calculated (block 110). Once the calculations D_1, D_2, T_1, and T_2 are completed, analysis of the video frame 10 for noise may begin.

In one embodiment of the invention, a series of queries determines whether the difference values D_1 and D_2 exceed the threshold values T_1 and T_2 (diamond 112). If the second difference value, D_2, is greater than the first threshold value, T_1, then noise has been detected. Accordingly, portions one and two of the video frame 10 are replaced with portion three (block 120). Further, the variable NOISEFOUND is set to TRUE (block 122), indicating that noise was found on the current frame. During analysis of subsequent frames, the variable NOISEFOUND is again tested. Next, if the second difference value, D_2, exceeds the second threshold value, T_2, and the variable NOISEFOUND is TRUE, then noise has again been detected (diamond 114). Again, portions one and two are replaced with portions three of the video frame 10 (block 120).

Where the first two calculations fail to result in noise detection, a second pair of inquiries may be initiated. The first difference value, D_1, is compared to the first threshold value, T_1 (diamond 116). If D_1 is larger, noise has been detected. In contrast to the result in block 120, however, only portion one is replaced with portion two (block 124). Otherwise, D_1 may be compared with the second threshold value, T_2. If D_1 is greater than T_2 and the variable NOISEFOUND is TRUE, then noise is detected (diamond 118). Again, portion one is replaced with portion two (block 124). The variable NOISEFOUND is set to TRUE (block 122). Otherwise, the variable NOISEFOUND is set to FALSE (block 126).

Following updates of the variable NOISEFOUND (block 122 and 126), the noisy edge removal mechanism 20 inquires whether the last frame has been reached (diamond 128). If so,

the operation is complete (block 130). Otherwise, the variable FRAME is incremented and the process is repeated (block 104). See Specification, pp. 10-12.

In Figure 7, in accordance with one embodiment of the invention, a processor-based system 70 may include a processor 30. The noisy edge removal mechanism 20 may be stored on the hard disk drive 44 such that, upon receiving the video input signal 62, the noisy edge removal program 20 is loaded into the memory 34 and executed. The video encoder 18, also stored on the hard disk drive 44 in one embodiment of the invention, may be used to encode the resulting frames. See Specification, pp. 12-13.

VI. ISSUES

A. Are Claims 1 and 32 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

B. Are Claims 2-3 and 6 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

C. Are Claims 4 and 5 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

D. Is Claim 7 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

E. Is Claim 8 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

F. Are Claims 9, 10, 16, 17 and 22 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

G. Are Claims 11, 13-14, 18 and 21 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

H. Are Claims 19 and 20 Patentable Under 35 U.S.C. §102(b) Over Lawlor

I. Is Claim 23 Patentable Under 35 U.S.C. §102(b) Over Lawlor

J. Is Claim 24 Patentable Under 35 U.S.C. §102(b) Over Lawlor?

K. Are Claims 25 and 30 Patentable Under 35 U.S.C. §102(b) Over Lawlor

L. Are Claims 26, 27 and 29 Patentable Under 35 U.S.C. §102(b) Over Lawlor

M. Is Claim 28 Patentable Under 35 U.S.C. §102(b) Over Lawlor

N. Is Claim 31 Patentable Under 35 U.S.C. §102(b) Over Lawlor

O. Are Claims 12 and 15 Patentable Under 35 U.S.C. §103(b) Over Lawlor

P. Is Claim 33 Patentable Under 35 U.S.C. §103(a) Over Lawlor

VII. GROUPING OF THE CLAIMS

For purposes of this appeal, the claims do not stand or fall together. Instead, for purposes of this appeal, Applicant has grouped together claims 1 and 32; claims 2-3, and 6; claims 4 and 5; claims 9, 10, 16, 17, and 22; claims 11, 13-14, 18 and 21; claims 19 and 20; claims 25 and 30; claims 26, 27, and 29; and claims 12 and 15, as set forth above. Claims 7, 8, 23, 24, 28, 31, and 33 each stand alone.

VIII. ARGUMENT

A. Claims 1 and 32 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 1 recites a method including receiving a video frame; identifying noise in a first portion of the video frame; and replacing the first portion with a second portion of the video frame. Claim 1 stands rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,353,0549 ("Lawlor"). This rejection is improper. Nowhere does Lawlor disclose (at least) identifying noise in a first portion of a video frame, as recited by claim 1.

In this regard, Lawlor analyzes a video frame by checking for data errors, not noise. *E.g.*, Lawlor, col. 7. These data errors are determined by analysis of error correction codes and, if an error exists, an error flag is set.

These data errors are not noise. That is, Lawlor discloses that digital signals are encoded using error correction and detection codes such that data errors occurring during transmission may be remedied. Lawlor, 1:17-23. It is telling that nowhere in Lawlor is the term "noise" even used. The clear import is that data errors are not noise, and certainly are not "noise in a video frame," as recited in claim 1. Thus claim 1 and claim 32 depending therefrom are patentable over Lawlor, and the rejection should be reversed.

B. Claims 2-3 and 6 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 2 depends from claim 1 and further recites that identifying noise includes associating a noise level with the first portion of the video frame and comparing the noise level to a predetermined value. Claim 2 and claims 3 and 6 depending therefrom stand rejected under §102(b) over Lawlor. This rejection is improper, for at least the reasons discussed above regarding claim 1 (*see* VIII.A).

Claim 2 is further patentable as Lawlor does not disclose associating a noise level with the first portion of a video frame and comparing the noise level to a predetermined value. In this regard, the portions cited by the Examiner (*see* Final Office Action, mailed November 5, 2003 ("Final Office Action"), p. 4) merely indicate that a frequency range of a sub-band containing a data error is determined. This is not associating a noise level with a first portion of a video frame. Nor does unit 640 of Lawlor perform any comparing of a (non-existent) noise level to a predetermined value. In this regard, unit 640 merely determines whether to substitute a data element from a previous or next frame with the value of an existing frame; it does not compare a

noise level to a predetermined value. For this further reason, claims 2-3 and 6 are patentable over Lawlor, and this rejection should be reversed.

C. Claims 4 and 5 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Dependent claim 4 depends from claim 3 and further recites that distinguishing the first and second portions of the video frame includes associating a first value with the first portion, associating a second value with the second portion, and performing a plurality of arithmetic operations between the first value and the second value. Claim 4 and claim 5 depending therefrom stand rejected under §102(b) over Lawlor. This rejection is improper, at least for the reasons discussed above with regard to claim 2 (*see* VIII.B).

Dependent claim 4 is further patentable as nowhere does Lawlor disclose performing a plurality of arithmetic operations between first and second values associated with first and second portions of a video image. In this regard, the portion of Lawlor contended to meet claim 4 merely states that based on the output of a lookup table (i.e., a read only memory), either an existing value of a video element is passed or a concealment value is passed: there is no performing of arithmetic operations between first and second values. Lawlor, 15:40-62. That is, a memory cannot perform arithmetic operations. For this further reason, claim 4 and claim 5 depending therefrom are patentable over Lawlor and the rejection should be reversed.

D. Claim 7 is Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 7 depends from claim 2 and further recites that comparing the noise level to a predetermined value comprises associating the predetermined value to the type of video input signal. Claim 7 stands rejected under §102(b) over Lawlor. This rejection is improper for the same reasons discussed above regarding claim 2 (*see* VIII.B). Furthermore, nowhere does Lawlor disclose associating a predetermined value to the type of video input signal. In this

regard, a spatial frequency range of a sub-band containing a corrupt element is not predicated on the *type* of video input signal. For this further reason dependent claim 7 is patentable and the rejection should be reversed.

E. Claim 8 is Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 8 depends from claim 2 and further recites that comparing the noise level to a predetermined value comprises associating the predetermined value to the type of noise in the video frame. Claim 8 stands rejected under §102(b) over Lawlor. This rejection is improper for the same reasons discussed above regarding claim 2 (*see* VIII.B). Furthermore, nowhere does Lawlor disclose associating a predetermined value to the type of noise in a video frame. In this regard, a spatial frequency range of a sub-band containing a corrupt element is not predicated on the *type* of noise in a video frame. For this further reason dependent claim 8 is patentable and the rejection should be reversed.

F. Claims 9, 10, 16, 17 and 22 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Independent claim 9 recites a system that includes *inter alia*, a storage medium that includes a software program that detects noise in a first portion of a video frame and replaces the first portion with a second portion of the video frame. For the same reasons discussed above regarding claim 1 (*see* VIII.A), claim 9 is patentable.

Furthermore, nowhere does Lawlor disclose a storage medium that includes a software program that detects noise in a first portion of a video frame and replaces the first portion with a second portion of the frame. In this regard, the Examiner contends that error flag analyzer 760 meets the claimed storage medium. Office Action, p. 6. Applicants respectfully disagree, as Lawlor discloses that error flag analyzer 760 is a programmable read-only memory that acts as a look up table; it merely outputs data values based on addresses provided to its input. As such, it

is neither a software program, nor does it operate as recited by claim 9. Thus, claim 9 is patentable. For the same reasons, claims 10, 16, 17 and 22 are patentable.

G. Claims 11, 13-14, 18, and 21 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 11 depends from claim 10 and further recites that the software program enables the system to further detect noise by comparing a noise level associated with the first portion of the video frame with a predetermined value. Claim 11 stands rejected under §102(b) over Lawlor. This rejection is improper, at least for the reason discussed above regarding claim 9 (*see* VIII.F). Claim 11 is further patentable for the same reason discussed above regarding claim 2, as Lawlor does not disclose comparing a noise level associated with a first portion of a video frame with a predetermined value (*see* VIII.B). Thus, claims 11, 13-14, 18, and 21 are patentable, and the rejection should be reversed.

H. Claims 19 and 20 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 19 depends from claim 18 and further recites instructions to associate a first value with a first portion of a video frame, associate a second value with a second portion, and perform a plurality of arithmetic operations between the first value and the second value. For the same reasons discussed above regarding claim 18 (*see* VIII.G) and claim 4 (*see* VIII.C), the rejection is improper and should be reversed. For the same reason, claim 20 depending from claim 19 is patentable.

I. Claim 23 Is Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 23 depends from claim 18 and further recites instructions to compare noise to a predetermined value by associating the predetermined value to the type of video signal. For the same reasons discussed above regarding claim 18 (*see* VIII.G) and claim 7 (*see* VIII.D), the rejection is improper and should be reversed.

J. Claim 24 Is Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 24 depends from claim 18 and further recites instructions to compare noise to a predetermined value by associating the predetermined value to the type of noise in the video frame. For the same reasons discussed above regarding claim 18 (*see* VIII.G) and claim 8 (*see* VIII.E), the rejection is improper and should be reversed.

K. Claims 25 and 30 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 25 recites a method including analyzing a first portion of a video frame with a first adjacent portion of the video frame to obtain a first result; analyzing a second portion of the video frame with a second adjacent portion of the video frame to obtain a second result; and replacing the first portion of the video frame with one of the second portion, the first adjacent portion, or the second adjacent portion if a comparison between the first result and the second results is indicative of noise. Claim 25 stands rejected under §102(b) over Lawlor. This rejection is improper, at least for the reasons discussed above regarding claim 1 (*see* VIII.A).

Furthermore, Lawlor does not disclose analyzing two portions of a video frame with two different adjacent portions to obtain two different results. In this regard, the Examiner contends that both of these claimed elements are met by a current element and surrounding elements. Final Office Action, p. 8. However nowhere does Lawlor disclose that any analyzing between adjacent portions is done. Further, these surrounding elements are sub-band components of the same frequency, and not adjacent portions of a video frame. Nor does Lawlor disclose replacing the first portion with one of a second portion or two different adjacent portions if a comparison between first and second results indicates noise. This is so, at least because there are no first and second results obtained in Lawlor. Thus, the rejection should be reversed as to claim 25 and claim 30 depending therefrom.

L. Claims 26, 27 and 29 Are Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 26 recites that the first and second portions and first and second adjacent portions each comprise a plurality of units, and the analyzing is done on a unit by unit basis. Claim 26 stands rejected under §102(b) over Lawlor. In addition to the reasons discussed above regarding claim 25 (VIII.K), claim 26 is further patentable as nowhere does Lawlor disclose analyzing different portions of a video image where each of the portions comprises a plurality of units and the analyzing is performed on a unit by unit basis. That is, the elements of Lawlor are not broken up into units. For this further reason claims 26, 27 and 29 are patentable.

M. Claim 28 Is Patentable Under 35 U.S.C. §102(b) Over Lawlor

Dependent claim 28 recites that the first and second results comprise a sum of absolute differences between the first portion and the first adjacent portion and the second portion and the second adjacent portion. In addition to the reasons discussed above regarding claim 26 (*see* VIII.L), claim 28 is further patentable as nowhere does Lawlor disclose calculating a sum of absolute differences between two groups of adjacent portions of a video frame. In this regard, the cited portion of Lawlor (*see* Final Office Action, pp. 8-9) relates to operations occurring between a present frame and delay frames, not a single frame. For this further reason, claim 28 is patentable over Lawlor.

N. Claim 31 Is Patentable Under 35 U.S.C. §102(b) Over Lawlor

Claim 31 depends from claim 1 and further recites encoding the replaced first portion of the video frame. Claim 31 stands rejected under §102(b) over Lawlor. For the same reason discussed above regarding claim 1, claim 31 is patentable (*see* VIII.A).

Claim 31 is further patentable, as any encoding performed by Lawlor is done *prior to* replacing portions of a video frame. In this regard, any such replacing is performed in block 140

of FIG. 1, well after encoding is performed in block 110. For this further reason, claim 31 is patentable, and the rejection should be reversed.

O. Claims 12 and 15 Are Patentable Under 35 U.S.C. §103(b) Over Lawlor

Claims 12 and 15 stand rejected under 35 U.S.C. §103(a) over Lawlor. For at least the same reasons discussed above regarding independent claim 9 (see VIII.F), these dependent claims are patentable over Lawlor.

P. Claim 33 Is Patentable Under 35 U.S.C. §103(a) Over Lawlor

Claim 33 stands rejected under §103(a) over Lawlor. Claim 33 depends from claim 1 and further recites that the noise results from handling closed caption signals. In addition to the reasons discussed above regarding claim 1 (*see* VIII.A), claim 33 is patentable as nowhere does Lawlor teach or suggest closed-caption signals. Nor does Lawlor teach or suggest noise resulting from such signals. Thus the rejection is improper and should be reversed.

IX. CONCLUSION

Since the rejections of the claims are baseless, they should be reversed.

Respectfully submitted,

Date: March 30, 2004

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APPENDIX OF CLAIMS

The claims on appeal are:

1. A method comprising:

receiving a video frame;

identifying noise in a first portion of the video frame; and

replacing the first portion with a second portion of the video frame.

2. The method of claim 1, wherein identifying further comprises:

associating a noise level with the first portion of the video frame; and

comparing the noise level to a predetermined value.

3. The method of claim 2, wherein associating further comprises distinguishing the first portion from the second portion.

4. The method of claim 3, wherein distinguishing further comprises:

associating a first value with the first portion;

associating a second value with the second portion; and

performing a plurality of arithmetic operations between the first value and the second value.

5. The method of claim 4, wherein associating a first value with the first portion further comprises:

identifying a plurality of values associated with the first portion; and

performing an arithmetic operation on the plurality of values to render the first value.

6. The method of claim 2, wherein comparing the noise level to a predetermined value comprises comparing the noise level to a noise level found in a second video frame.

7. The method of claim 2, wherein comparing the noise level to a predetermined value comprises associating the predetermined value to the type of video input signal.

8. The method of claim 2, wherein comparing the noise level to a predetermined value comprises associating the predetermined value to the type of noise in the video frame.

9. A system including:

a bus;

a processor coupled to the bus;

a device coupled to the bus to receive a video signal; and

a storage medium coupled to the bus including a software program that, if executed, enables the system to:

detect noise in a first portion of a video frame of the video signal; and

replace a first portion of the video frame with a second portion of the video frame.

10. The system of claim 9, wherein the video frame is stored in a memory and, if executed, the software program enables the system to write to the memory to replace the first portion of the video frame.

11. The system of claim 10, wherein, if executed, the software program enables the system to further detect noise by comparing a noise level associated with the first portion of the video frame with a predetermined value.

12. The system of claim 11, wherein the predetermined value is stored in the memory.

13. The system of claim 12, wherein the predetermined value is related to a noise level found in a second video frame.

14. The system of claim 12, wherein the predetermined value is related to the type of video signal.

15. The system of claim 9, wherein the storage medium is a hard disk drive.

16. An article comprising a medium storing instructions that cause a processor-based system to:

locate a video frame of a video signal;

identify noise in a first portion of the video frame; and

replace the first portion with a second portion of the video frame.

17. The article of claim 16, further storing instructions that cause the processor-based system to locate the video frame by reading a memory device.

18. The article of claim 17, further storing instructions that cause the processor-based system to:

associate a noise level with the first portion of the video frame; and

compare the noise level to a predetermined value.

19. The article of claim 18, further storing instructions that cause the processor-based system to:

associate a first value with the first portion;

associate a second value with the second portion; and

perform a plurality of arithmetic operations between the first value and the second value.

20. The article of claim 19, further storing instructions that cause the processor-based system to:

identify a plurality of values associated with the first portion; and

perform an arithmetic operation on the plurality of values to render the first value.

21. The article of claim 18, further storing instructions that cause the processor-based system to compare the noise level to a predetermined value by associating the predetermined value with a noise level found in a second video frame.

22. The article of claim 16, wherein the medium storing instructions is a memory device.

23. The article of claim 18, further storing instructions that cause the processor-based system to compare the noise to a predetermined value by associating the predetermined value to the type of video signal.

24. The article of claim 18, further storing instructions that cause the processor-based system to compare the noise to a predetermined value by associating the predetermined value to the type of noise in the video frame.

25. A method comprising:

receiving a video frame;

analyzing a first portion of the video frame with a first adjacent portion of the video frame to obtain a first result;

analyzing a second portion of the video frame with a second adjacent portion of the video frame to obtain a second result; and

replacing the first portion of the video frame with one of the second portion, the first adjacent portion or the second adjacent portion if a comparison between the first result and the second result is indicative of noise.

26. The method of claim 25, wherein each of the first and second portions and the first and second adjacent portions comprises a plurality of units, and wherein the analyzing is performed on a unit by unit basis.

27. The method of claim 26, further comprising calculating a first threshold based upon an amount of the plurality of units per the respective portion.

28. The method of claim 27, wherein the first and second results comprise a sum of absolute differences between the first portion and the first adjacent portion and the second portion and the second adjacent portion, respectively.

29. The method of claim 27, wherein the comparison is indicative of noise if a difference between the first result and the second result exceeds the first threshold.

30. The method of claim 25, wherein the first portion comprises an edge portion of the video frame.

31. The method of claim 1, further comprising encoding the replaced first portion of the video frame.

32. The method of claim 1, further comprising replacing a first line of the video frame with a second line of the video frame.

33. The method of claim 1, wherein the noise results from handling closed caption signals.